Pramāṇa

a journal of physics

Volume 23, July–December 1984

CONTENTS

Atomic and Molecular Physics

Photoacoustic studies on excitation transfer in Rh6G and RhB dye mixture ..... *V N Rai, S N Thakur and D K Rai* 215–219

Nonresonant third harmonic generation in thallium vapour..... *Sharada Itagi and Abdul Rafe Khan* 221–227

Dielectric studies in dilute solutions..... *Rajni Misra, Amar Singh, J P Shukla and M C Saxena* 229–233

Computer calculation of positron drift velocities in He, Ne and Ar... *P S Grover, Sanjay Kumar and K V Sinha* 235–243

Raman effect in the x-ray region..... *Ashok Pimpale and Chintamani Mande* 279–295

The electron-electron interaction in doubly-excited states of atoms ... *A R P Rau* 297–303

Absorption spectrum of the HCCO radical..... *S L N G Krishnamachari and R Venkatasubramanian* 321–325

Semiempirical molecular orbital calculation for four-, six- and eight-atom systems ..... *C P D Dwivedi* 529–539

Quasisymmetry and classification of molecular structures ..... *M Kondala Rao and Ch. Suryanarayana* 803–808

Cosmic Physics

^{3}He-rich solar flares ..... *S Ramadurai, M N Vahia, S Biswas and K Sakurai* 305–311

Experimental Techniques

Flip angle dependence in two-dimensional multiple quantum coherence NMR spectroscopy ..... *N Murali, Y V S Ramakrishna, K Chandrasekhar, M Albert Thomas and Anil Kumar* 547–557

ΔT-window neutron spectrometer. . . . . *P S Goyal, C L Thaper and B A Dassannacharya* 559–571

General Relativity

A neutrino universe with viscosity . . . . . *Bijan Modak* 809–814

Instrumentation

Modified vacuum vibrator ion source for phosphorous and boron ions . . . . . *N K Patil, P N Kulkarni, M R Bhiday and V N Bhoraskar* 245–249

A simple instrument for relative microhardness measurement . . . . . *K Kishan Rao and D B Sirdeshmukh* 251–256

High resolution measurement of Bragg cut-off in beryllium. . . . . *C L Thaper, P S Goyal and B A Dasannacharya* 313–319

Letters

High pressure transport behaviour of AgI-Ag_2O-MoO_3 glasses and the cluster model . . . . . *S Hemlata, G Parthasarathy, K J Rao and E S R Gopal* L269–L273

Conditions for the relativistic virial theorem for one electron . . . . . *Sambhu N Datta* L275–L278

Velocity dependent inertial induction—An extension of Mach's principle . . . . . *Amitabha Ghosh* L671–L674

An auger electron spectroscopic investigation of the electron states of copper alloys. . . . . *P Sen, D D Sarma and C N R Rao* L815–L818

Liquid Crystals

Optical anisotropy of some cholesteryl esters of fatty acids . . . . . *H S Subrahmanyam and Upkar Singh Hunjan* 639–643

Liquid Physics

Calculation of entropy of mixing of liquid metal alloys in a hard sphere system. . . . . *P Singh and K N Khanna* 511–518

Evaluation of the SSCF and PY approximations for quadrupolar fluids . . . . . *J Ram* 519–528

Liquid State

Critical properties of nitrobenzene solutions by electric conductivity method . . . . . *B Matuszewska and T Hilczer* 47–52

Anomaly in electric resistance of binary liquids near the critical point . . . . . *B Matuszewska* 53–57

Optical transitions of Eu^{3+} ions in $EuCl_3$ solutions. . . . . *S Ram, C P Lamba and H D Bist* 59–68

Mathematical Physics

Gauge fields, space-time geometry and gravity . . . . . *Tulsi Dass* 433–443

Symmetry groups of mathematical physics . . . . . *P Rudra* 445–457

Quasi invariants and generalized Killing vectors. . . . . *B R Sitaram and Ram K Varma* 459–465

Superposition of special non-abelian potentials . . . . . *Sunil Kumar and D C Joshi* 541–546

Nuclear and Particle Physics

Phase shift analysis of pion-^{4}He scattering by optimal polynomial expansion . . . . . *K M Das and B B Deo* 91–97

Recoil corrections to magnetic moments of charmed baryons in the MIT bag model. . . . . *K P Tewari and C P Singh* 99–107

Nonleptonic decay matrix elements in the variable pressure bag model . . . . . *P K Chatley and M P Khanna* 109–118

Side-bands in ^{170}Yb . . . . . *S V Moholkar, C S Warke and M R Gunye* 165–174

Regionwise absorption in nuclear optical model. . . . . *C S Shastry and Y K Gambhir* 175–186

Calibration of different plastic track detectors using accelerated heavy ions. . . . . *S M Farid* 187–198

Which is heavier—*d* or *u* quark?. . . . . *S Chakrabarty* 199–203

Gauge theories of weak and strong gravity. . . . . *K P Sinha* 205–214

Soliton and boundary condition induced fractional fermion number . . . . . *S M Roy and Virendra Singh* 333–342

Zeros of the helicity amplitudes Σ^--*p* and Λ-*p* elastic scattering . . . . . *S Mohanty and J K Mohapatra* 475–484

Elastic scattering of 36 MeV alpha particles from ^{197}Au . . . . . *S Kailas, S K Gupta, S Bhattacharya, S N Chintalapudi and Y P Viyogi* 495–500

Are weak vector bosons composite? . . . . . *S N Biswas, S Rai Choudhury, K Datta and Ashok Goyal* 607–622

Charmonium and upsilon systems with fine-hyperfine splittings. . . . . *S N Jena and T Tripati* 623–630

Superspace ward identities in supersymmetric gauge theories. . . . . *Darwin Chang and Asim Gangopadhyaya* 631–637

Probing proton spin structure through hadronic reactions. . . . . *M Rafat and R Ramachandran* 675–693

On higher order computations in strong coupling . . . . . *Carl M Bender, Ashok Das and Hwa-Aun Lim* 695–701

Bethe-Salpeter equation with the sine-Gordon interaction . . . . . *G P Malik and Gautam Johri* 703–713

Is reggeon field theory rendered obsolate by QCD? . . . . . *B Sidhanta* 715–719

Light ion fusion in deformation model. . . . . *R C Nayak* 767–783

Optics

Cumulant functions in optical coherence theory. . . . . *C L Mehta* 327–332

Plasma Physics

Rotating relativistic electron beam-plasma interaction and formation of a field-reversed configuration. . . . . *K K Jain and P I John* 1–16

Origin of fine structures in solar radio bursts. . . . . *G S Lakhina and B Buti* 343–349

Potential double layers in double plasma device. . . . . *A N Sekar and Y C Saxena* 351–368

Ion acoustic subharmonic excitation in a plasma . . . . . *R S Chhabra* 501–509

Nonlinear distribution function for a plasma obeying Vlasov-Maxwell system of equations . . . . . *Saroj K Majumdar* 785–801

Quantum Mechanics

A geometric generalization of classical mechanics and quantization . . . . . *R K Varma* 369–379

Operator method and eigenvalues of the triple-well anharmonic oscillator . . . . . *R K Roy Choudhury and Barnana Ghosh* 645–649

A hermitian open-shell many-body perturbation theory for treating intruder states. . . . . *Md. Azizul Hague and Debashis Mukherjee* 651–664

Quantum Physics

Analysis and merit of the constrained-component variation in Dirac theory. . . . . *Sambhu N Datta and S Jagannathan* 467–473

Relativity

Black hole thermodynamics from a possible model for internal structure . . . . . *P Goswami and K P Sinha* 381–384

Solid State Physics

Electrical transport and high pressure studies on bulk $Ge_{20}Te_{80}$ glass . *G Parthasarathy, A K Bandyopadhyay, S Asokan and E S R Gopal* 17–29

Pressure-induced electronic and structural transformations in bulk $GeSe_2$ glass . . . . *M V N Prasad, G Parthasarathy, S Asokan and E S R Gopal* 31–37

Validity regions of charge shift model . . . . . *S N Gupta, G Varma and H C Verma* 39–46

Dynamic response approach to dynamic image potential . . . . . *P R Rao, Chayanika Shah and G Mukhopadhyay* 119–128

Optical absorption spectra of tripositive erbium ion in certain nitrate complexes . . . . . *S V J Lakshman and C K Jayasankar* 129–140

Temperature dependence of ^{79}Br NQR frequency in cadmium, strontium, barium, zinc, magnesium and nickel bromates . . . . . *S Ramaprabhu, R Valli and K V S Rama Rao* 141–148

Thermal properties of cubic metals in anharmonic approximation. . . . . *O P Gupta* 149–154

Ultrasonic velocities and elastic constants in tin-indium alloys. . . . . *N Swarnalata and A R K L Padmini* 155–163

Effect of correlation and spin-polarisation on the band structure of metallic dysprosium . . . . . *P K Mukhopadhyay, C K Majumdar and K C Das* 385–394

Mechanism of phase transformations in ZnS . . . . . *M T Sebastian and P Krishna* 395–403

Pressure and volume dependence of the LO-TO phonons in InAs . . . . . *A Jayaraman, V Swaminathan and B Batlogg* 405–410

$Ga_{0.47}In_{0.53}As$—The material for high-speed devices. . . . . *Biswa Ranjan Nag* 411–421

Electron transport in Chevrel phase superconductors, $Cu_{1.8}Mo_6S_{8-y}Se_y$, $0 \leqslant y < 8$ and $Cu_{1.8}Mo_6S_{8-y}Te_y$, $0 \leqslant y \leqslant 4$—Fit to Cote-Meisel theory . . . . . *V Sankaranarayanan, G Rangarajan and R Srinivasan* 423–432

Refractive indices and related properties of some potential mixed crystals . . . . . *D K Ghosh, L K Samanta and G C Bhar* 485–493

Infrared studies on ion irradiated quartz . . . . . *A K Sood, V Umadevi, R Kesavamoorthy and G Venkataraman* 573–593

X-ray determination of the Debye-Waller factors and Debye temperatures of AgCl and AgBr. . . . . *K Srinivas and D B Sirdeshmukh* 595–597

Thermal conduction through loose and granular two-phase materials at normal pressure . . . . . *R N Pande and D R Chaudhary* 599–605

Lattice imperfection studies in ploycrystalline materials by x-ray diffraction line-profile analysis ..... *M De and S P Sen Gupta* 721–744

An explanation of the phenomenon of polytypism..... *S Ramasesha* 745–749

Lattice dynamical study of alkali metals: An unified approach based on CGW model ..... *V Ramamurthy and M Satishkumar* 751–765

Spectroscopy

Isotope shift in the $A^1\Pi$-$X^1\Sigma^+$ system of PN molecule ..... *P Saraswathy and G Krishnamurty* 665–669

Statistical Physics

Light scattering from a nonequilibrium fluid undergoing a planar Poiseuille-Couette flow..... *Debendranath Sahoo* 69–77

Thermodynamic properties of a two-dimensional square-well fluid ... *B M Mishra and S K Sinha* 79–90

$1/f$ noise and resistivity of spin glasses ..... *Debashish Chowdhury and Abhijit Mookerjee* 257–261

Cluster Bethe lattice model studies of chemisorption: H on Ni surface ..... *B C Khanra* 263–268